

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:)	
Inventors: Jiaping Song)	ATTORNEY FILE NO.: SLA1167
Serial No.: 10/092,199)	
)	Examiner: Qin, Yixing
Filed: March 4, 2002)	Customer No.: 55,286
Title: SYSTEM AND METHOD FOR)	Group Art: 2622
PRINTING A CAMERA IMAGE))	
WITH TIME STAMP)	Confirmation No.: 8581
)	



Board of Patent Appeals and Interferences
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

This is an appeal from the rejection by Examiner Yixing Qin, Group Art Unit 2622, of claims 1, 3-11, and 13-18 as set forth in the CLAIMS APPENDIX, all claims in the application.

REAL PARTY IN INTEREST

The real party in interest is Sharp Laboratories of America, Inc., as assignee of the present application by an Assignment in the United States Patent Office with a Recordation Date of March 4, 2002, at Reel 012808, Frame 0102.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF THE CLAIMS

Claims 1, 3-11, and 13-18 are in the application.

Claims 1, 3-11, and 13-18 are rejected.

Claims 1, 3-11, and 13-18 are appealed.

STATUS OF AMENDMENTS

Amendments to the claims were made in an Office Action response received at the PTO on December 2, 2005. These claim amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention of claims 1, 10, and 11 describes a printer and printing method that is able to manipulate image and time stamp information that has been downloaded from a digital camera. As shown in Fig. 1 (see Evidence Appendix, Attachment B) and described in the specification at page 7, ln. 6 through page 8, ln. 7 (see Evidence Appendix, Attachment A), the present invention (controller) converts both the image

and time stamp information into bitmaps. The printer front panel is used to edit the image and time stamp information (e.g., the style and placement of the time stamp on the image can be selected). As a result of the front panel editing, the time stamp bitmap is embedded into the image bitmap and sent to the print engine for printing. The above-mentioned process can be accomplished in the printer itself, without the use of an embedded print driver or connected computer (with an embedded print driver).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1, 3-7, 10-11, and 13-16 are unpatentable under 35 U.S.C. 103(a) with respect to Kakigi et al. ("Kakigi"; US 2002/0054350), in view of Shiota et al. ("Shiota"; US Patent 6,185,000).

2. Whether claims 8-9 and 17-18 are unpatentable under 35 U.S.C. 103(a) with respect to Kakigi, Shiota, and further in view of Kobori et al. ("Kobori"; US Patent 5,028,993).

ARGUMENT

1. The rejection of claims 1, 3-7, 10-11, and 13-16 under 35 U.S.C. 103(a) as unpatentable with respect to Kakigi et al. ("Kakigi"; US 2002/0054350), in view of Shiota et al. ("Shiota"; US Patent 6,185,000).

Section I of the Office Action states that claims 1, 3-7, 10-11, and 13-16 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Kakigi in view of Shiota. With respect to claims 1 and 10, the

Office Action acknowledges that "(a)lthough Kakigi does not explicitly disclose that the date (i.e., time stamp) is embedded in the image after editing. It would be inherent that this is so, since the Kakigi reference discloses the date information as part of the inherent image information in item 23 of Fig. 5." The Office Action goes on to say that the Shiota reference discloses time stamp editing performed through a computer before it is sent to the printer. The Office Action states that, "the Kakigi reference alludes to the fact that there are multiple ways to process images (i.e. directly from the camera to the printer, or from the camera to a computer then to the printer – similar to the embodiments in the applicant's specification)." The Office Action concludes that "...it would be obvious...to modify Kakigi's invention to include an editing program like the one in Shiota on the printer since one of Kakigi's main points is that the involvement computer is not necessary and processing can be performed on the printer..."

With respect to claim 11, the Office Action equates Kakigi's video controller with the recited controller. The Office Action states that Kakigi discloses that a bitmap image is generated from read data, and that "(i)t would have been obvious... that the time stamp to be converted to bit map as well since it is a known that printers are common to convert data into bit map information." This rejection is traversed as follows.

An invention is unpatentable if the differences between it and the prior art would have been obvious at the time of the invention. As stated in MPEP § 2143, there are three requirements to establish a *prima facie* case of obviousness.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck* 947 F.2d 488, 20 USPQ2d, 1438 (Fed. Cir. 1991).

In the description of Fig. 1, Kakigi describes a digital camera 1 that can store image data in a detachable memory card 110. The card is also capable of storing image "attribute information", such as the date of the photograph [0153-0154]. Once this data is stored in the printer, the printer is able analyze print jobs using the attribute information. An example is given of a printer that organizes all the images photographed on the same day, and sends prints of those images to the same tray [0165]. As noted in the Office Action, Fig. 5 depicts an image file, which includes the date attribute.

More explicitly, in the description of Fig. 8, Kakigi states that image data is received by the printer from either the digital camera memory card, or from the data processor 101. The data processor 101 is connected via a general interface (e.g., RS232C) to receive code data such as PostScript or LIPS [0218]. A video controller 203 can be connected to the general interface via the data processor 101 to receive a print job (e.g., in the PDL language). The video controller supplies dot data to the engine controller.

Also as noted in the Office Action, [0022] describes the step of generating bit map image data for printing. This paragraph references Fig. 13 (a detailed description of a video controller), which states that

image data generating portion 403 generates bit map data for an actual printing based on control code data transmitted from data processor 101 [0275]. As noted above, control code data is a conventional print job in a language such as PDL.

The Kakigi patent is a voluminous document with many embodiments. Generally however, Kakigi discloses a printer that uses a data processor and video controller to perform conventional printing functions. These conventional functions are the receiving of a print job in a language such as PDL or PostScript, the generation of a bitmap from the print job, and the sending of the bitmap to a print engine for printing. In one aspect, Kakigi's printer is able to accept image data directly from a camera, along with auxiliary information, such as date.

Shiota describes a personal computer (PC) that accepts a memory card with a digital image, to which additional information has been added, such as a title or date (col. 3, ln. 46-65). A program residing in the PC is able to display the image in the form of a printing instruction screen 9. Using the printing instruction screen 9, a user is able to manipulate the additional information, and add it to the image data 7. The resultant file can be transported via a medium such as a hard disk 4, and loaded into a printer 5. Generally, Shiota describes a system such a Photoshop, which permits a digital image to be modified before it is sent to the printer.

Shiota describes an image as consisting of a raw image, with attributes about the image. Many conventional image processing applications add a title to an image by setting up the attribute (i.e., title) of the image for printing, without necessarily modifying the image itself. The application used to support the printing of the image then draws the

title on top of the image. In a sense, the printer receives the image, modified so that the title is superimposed on top of the image. Although the end result may appear similar to an image created using the claimed invention, the Applicant respectfully submits that the receiving of an image with a superimposed title is not the same process as embedding time stamp bitmap information into the image bitmap information.

With respect to the first *prima facie* requirement, Shiota does not suggest any modifications to the Kakigi's disclosure that would make obvious the conversion of time stamp information into a bitmap, or the embedding of a time stamp bitmap into an image bitmap. The Office Action states that "...it would be obvious...to modify Kakigi's invention to include an editing program like the one in Shiota on the printer since one of Kakigi's main points is that the involvement computer is not necessary and processing can be performed on the printer..." This conclusion is inaccurate, as explained in more detail below.

Conventionally, image processing is performed on a platform with significant processing power, such as a personal computer, using a print driver. As is well understood by those with skill in the art, print drivers and associated image processing applications are complicated, using a number of software modules, and requiring an extensive amount of memory and processing power. Conventionally, a printer driver creates a print job in a relatively simple print job language (e.g., PCL or PostScript) to minimize the processing that need be performed by the printer. The printer can thus be made more economically, with less memory and less processing power. The printer converts the print job language into a bitmap or raster data. Alternately stated, the printer is unable perform any sophisticated manipulation of the bitmap data. That

is, a conventional printer controller is unable to embed one image into another, or create a bitmap from formatted image data (e.g., TIFF, JPEG, or PNG). In particular, a conventional printer is unable to convert time stamp data encoded in an image file, into a bitmap, or embed a time stamp bitmap into an image bitmap.

As acknowledged in the Office Action, Kakigi cannot embed a time stamp bitmap into an image bitmap. Shiota discloses that time stamp and image information can be manipulated on a PC using a print driver (similar to Photoshop). However, even Shiota fails to describe a process that embeds one bitmap inside of another bitmap. Since Kakigi provide no means for sophisticated image data manipulation on a printer, the combination of Shiota with Kakigi merely reinforces the conventional perception that a computer-based print driver would be needed to perform the functions recited in the Applicant's claims 1 and 10.

With respect to claim 11, the Office Action states that Kakigi discloses a bitmap image generated from read data, and that "(i)t would have been obvious... that the time stamp information to be converted to bit map as well since it is a known that printers are common to convert data into bit map information." However, as presented above, Kakigi can only generate bitmap data from a print job or from camera images. Kakigi discloses absolutely no means of converting "attribute information", such as date, into bitmap information. Even when combined with Shiota, Kakigi discloses no means of embedding one bitmap into another bitmap.

Considered from the perspective of the second *prima facie* requirement, even if an expert were given the Kakigi and Shiota disclosures as a foundation, there is no reasonable expectation that this

expert could derive the claimed invention, since all the prior art references suggest that image modifications must be performed with a print driver on a PC, prior to being sent to the printer. Alternately stated, the references all assume that an externally located print driver application is required to implement the time stamp processing.

With respect to the third *prima facie* requirement, the combined references do not disclose all the elements of the claimed invention. Claims 1, 10, 11 describe image processing being performed by a printer in response to prompts at the printer's front panel. As mentioned earlier, Shiota is the only reference that performs any type of image manipulation, but this processing is done prior to being sent to the printer.

Further, claims 1, 10, and 11 describe a process of embedding time stamp bitmap information into the image bitmap information. Neither Shiota nor Kakigi describe a printer that is able to embed time stamp bitmap information in an image bitmap. Alternately stated, the claimed invention time stamp bitmap information is embedded in the image bitmap without the use of a specialized printer driver.

The Kakigi disclosure, even when combined with Shiota, does not explicitly describe all the limitations of claims 1, 10, and 11. Neither do the references suggest any modifications that that make the claim limitations obvious. Claims 3-7, dependent from claim 1, claims 13-16, dependent from claim 11, enjoy the same distinctions from the cited prior art.

2. *The rejection of claims 8-9 and 17-18 under 35 U.S.C. 103(a) as unpatentable with respect to Kakigi, Shiota, and further in view of Kobori et al. ("Kobori"; US Patent 5,028,993).*

The Office Action acknowledges that neither Shiota nor Kakigi disclose any details of providing an image where the time stamp information appears to be superimposed over the image. The Office Action states that Kobori describes a process for synthesizing text and background information, and that Kobori's control panel could be used to control a printer. The Office Action also states that since all the references are in the art of the manipulation and printing of images, it would have been obvious to improve Kakigi's invention with Shiota's and Kobori's editing capabilities to allow users more flexibility in customizing images. This rejection is traversed as follows.

Kobori discloses a video printer that converts video data into a hardcopy. Kobori's video printer is significantly different from Kakigi's printer, or from any conventional printer. RGB (red/green/blue) color signals are converted into an analog picture, and then converted into digital data (col. 3, ln. 25-37). The majority of the disclosure is spent describing the processing of RGB digital data (col. 4, ln. 41 and on). Even the hardcopy printer 7 operates in response to RGB inputs.

Generally, there are no similarities between an analog NTSC video signal (Kobori) and a digital still camera image. NTSC video is an analog signal in a specified format designed originally for broadcast television. That format does not inherently include any ancillary data such as time information. Closed captioning, for example, is encoded in the form of unused scan line analog signals that are placed in the video stream. These scan lines must be decoded by the receiver, before they are

displayed as text. There is no differentiation in the receiver between time and other characters or numbers. In short, overlaying video signals (Kobori) and bitmap data manipulation (the Applicant) are separate and distinct technologies.

With respect to the first *prima facie* requirement, the Office Action states that it would have been obvious to improve Kakigi's invention with Shiota's and Kobori's editing capabilities to allow users more flexibility in customizing images. This statement does not provide any analysis of how Kobori suggests any kind of modification to Kakigi. Rather, it is an example of a retrospective analysis that combines prior art references on the basis of a search using elements from the Applicant's claims as keywords.

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Here, the Office Action presents laudatory goals as the desirability of the combination. To support a *prima facie* case, the Office Action should present evidence that an expert would recognize that a particular component from Kakigi's disclosure could be modified in light of a particular component from the Kobori disclosure.

Viewed from an alternate perspective (the second *prima facie* requirement), no evidence has been provided that processes from a device that uses video-converted RGB signals has any application to a print engine that uses bitmap information as input data.

With respect to the third *prima facie* requirement, even if the three prior art references are combined, that combination does not teach all the elements of base claims 1 and 11. As noted above, neither Shiota

nor Kakigi describe the conversion of time stamp information into bitmap information, or the embedding of bitmap information. Kobori describes no process for converting time stamp data into bitmap data, so the combination of Shiota, Kakigi, and Kobori also fails to teach this limitation recited in claims 1 and 11. Further, while Kobori does disclose some sort of image superposition process, he does not describe a process that embeds one bitmap inside another. Again, the combination of Shiota, Kakigi, and Kobori fails to explicitly describe, or suggest modifications that make all the limitations of claims 1 and 11 obvious. Claims 7-8, dependent from claim 1, and claims 17-18, dependent from claim 11, all enjoy the same distinctions from the cited prior art.

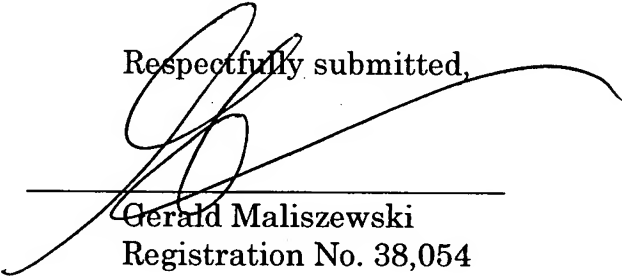
SUMMARY AND CONCLUSION

It is submitted that for the reasons pointed out above, the claims in the present application clearly and patentably distinguish over the cited references. Accordingly, the Examiner should be reversed and ordered to pass the case to issue.

A PTO-2038 form is enclosed, in the amount of \$500.00, to cover the fee for this Appeal Brief. Authorization is given to charge any deficit or credit any excess to Deposit Account No. 502033.

Respectfully submitted,

Date: 5/1/2006



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ATTACHMENT A (Applicant's Specification)

ATTACHMENT B (Applicant's Drawings)

ATTACHMENT C (Kakigi et al.; US 2002/0054350)

ATTACHMENT D (Shiota et al.; US 6,185,000)

ATTACHMENT E (Kobori et al.; US 5,028,993)

CLAIMS APPENDIX

IN THE CLAIMS:

1. (previously presented) A method for using a printer to interpret time stamp information from a digital camera, the method comprising:

receiving image information from a digital camera in a first format with corresponding time stamp information at a printer interface;

converting the image information and time stamp information to bitmap information;

at a printer front panel, displaying the images with corresponding time stamps for editing;

in response to the editing, embedding time stamp bitmap information in the image bitmap information; and,

supplying the edited images with corresponding time stamps to a print engine for printing.

2. canceled

3. (previously presented) The method of claim 1 further comprising:

opening a first format interpreter;

wherein receiving image information from a digital camera in a first format includes using the first format interpreter to accept the image information and corresponding time stamp; and,

wherein converting the image information and time stamp to bitmap information includes using the first format interpreter to convert

the image information and corresponding time stamp into bitmap information.

4. (previously presented) The method of claim 3 further comprising:

using the printer front panel to select the "print time stamp" option; and,

wherein converting the image information and time stamp to bitmap information includes converting the time stamp into bitmap information in response to selecting the "print time stamp" option.

5. (original) The method of claim 4 wherein receiving image information from a digital camera in a first format includes receiving information in a first format selected from the group including joint photographic experts group (JPEG) and tagged image file format (TIFF) formats.

6. (previously presented) The method of claim 4 further comprising:

using the printer front panel to select a time stamp layout for a corresponding image; and,

wherein supplying the images with corresponding time stamps for printing including supplying the image with the selected time stamp layout.

7. (original) The method of claim 6 wherein selecting the time stamp layout for the corresponding image includes selecting from

the group including the location of the time stamp on the image, the time stamp font style, the time stamp font size, and the time format.

8. (previously presented) The method of claim 6 further comprising:

using the printer front panel to select miscellaneous superposition overlays for corresponding images; and,

wherein supplying the images with corresponding time stamps for printing including supplying images with the selected superposition overlays.

9. (original) The method of claim 8 wherein selecting miscellaneous superposition overlays for corresponding images includes selecting superposition overlays from the group including text messages, backgrounds, clipart, and image borders.

10. (previously presented) A method for a printer to interpret time stamp information from a digital camera, the method comprising:

receiving image information at a printer interface from a digital camera in a first format selected from the group including joint photographic experts group (JPEG) and tagged image file format (TIFF) formats, with a corresponding time stamp information;

at a printer front panel, displaying the images with corresponding time stamps for editing;

using the printer front panel to select the "print time stamp" option;

using the printer front panel to select a time stamp layout for a corresponding image;

converting the image information and time stamp information to bitmap information;

in response to the selected time stamp layout option, embedding time stamp bitmap information in the image bitmap information; and,

supplying the edited images with corresponding time stamps to a print engine for printing.

11. (previously presented) A printer having a capacity for manipulating time stamp information from a digital camera, the printer comprising:

a controller having a port to receive image information from a digital camera in a first format with a corresponding time stamp and a port to supply images with corresponding time stamps, converted into bitmap information;

a user interface front panel having a port connected for communication with the controller, the user interface front panel accepting time stamp print user prompts and supplying instructions to the controller for printing a time stamp;

wherein the controller supplies time stamp bitmap information embedded in the corresponding image bitmap information, in response to the time stamp print commands from the user interface front panel; and,

a printer engine having a port connected to the controller for accepting the images with corresponding time stamps for printing.

12. canceled

13. (previously presented) The system of claim 11 wherein the user interface front panel receives images for display, receives image modification user prompts, and supplies commands to the controller for modifying the images with corresponding time stamps; and, wherein the controller modifies the bitmap image data in response to commands from the user interface front panel.

14. (original) The system of claim 13 wherein the controller receives image information from the digital camera in a first format selected from the group including joint photographic experts group (JPEG) and tagged image file format (TIFF) formats.

15. (previously presented) The system of claim 13 wherein the user interface front panel accepts user prompts for selecting a time stamp layout on a corresponding image, and supplies the time stamp layout commands to the controller; and, wherein the controller accepts the time stamp layout information and provides images with corresponding time stamp layouts for printing in response to the time stamp layout commands.

16. (previously presented) The system of claim 15 wherein the user interface front panel accepts prompts for selecting the time stamp layouts selected from the group including the location of the

time stamp on the image, the time stamp font style, the time stamp font size, and the time format.

17. (previously presented) The system of claim 15 wherein the user interface front panel accepts prompts for selecting miscellaneous superposition overlays for corresponding images; and, wherein the controller supplies images for printing with the corresponding superposition overlays in response to the miscellaneous superposition overlay prompts.

18. (previously presented) The system of claim 17 wherein the user interface front panel accepts prompts for miscellaneous superposition overlays selected from the group including text messages, backgrounds, clipart, and image borders.

EVIDENCE APPENDIX



**SYSTEM AND METHOD FOR PRINTING
A DIGITAL CAMERA IMAGE WITH TIME STAMP**

Invented by
Jiaping Song



SYSTEM AND METHOD FOR PRINTING A DIGITAL CAMERA IMAGE WITH TIME STAMP

BACKGROUND OF THE INVENTION

5 1. Field of the Invention

This invention generally relates to digital photography and, more particularly, to a system and method for hardcopy printing the time stamp information that accompanies the image of a corresponding digital photograph.

10 2. Description of the Related Art

Conventionally, when digital images are downloaded into a personal computer or specialized printer, an application must be used to open the image first, before a Joint Photographic Experts Group (JPEG) or Tag Image File Format (TIFF) image file can be operated on. Then, a
15 printer driver is used to convert the data into a printer-ready format. Some prior art printer drivers provide users with the ability to embed some additional information into the output image. For example, users can add watermarks or backgrounds to the printing data. Prior art printer drivers work well on most image files, however, some information
20 of the image file generated by a digital camera is lost in the printing process. Specifically, when these prior art printer drivers process images generated by a digital camera, the date or time stamp information for the corresponding pictures is lost.

Industrial printers exist that provide a limited capability for
25 editing an image at the printer. These specialized printers allow the user to add prepress operations including adding page numbers, header/footer text, or photos and/or halftones to an existing page of text. However,

these printers do not allow the user to extract date information from an image file before a hard copy of the image is made. It is also known to digitally modify raster data or embed signatures within visual images in both digital representation and print or film. However, there is no process
5 of printing the time stamp with an image using a conventional printer.

It would be advantageous if the time stamp information that accompanies the image information downloaded from a digital camera could be used.

It would be advantageous if a user could easily select the
10 time stamp to be included on the printed image. Likewise, it would be advantageous if the presentation and placement of time stamp information on the image could be easily manipulated by a user.

SUMMARY OF THE INVENTION

15 The present invention uses the printer front panel and the information from the image itself to produce user-desired output, such as including the time stamp information with the printed image. What makes the invention different from the prior art is:

- 1) The user does not need a specific print driver
20 configured to modify the bitmap data stream;
- 2) The user does not need a particular viewer or reader to open the image prior to sending the image to the printer;
- 3) The information from the image is fully utilized to produce user-desired output; and,
- 25 4) The user can use the printer's front panel to locate the time stamp information on the printed image.

The present invention adds a JPEG or TIFF interpreter to the printer controller, and utilizes the printer front panel to communicate with the user. Since the printer controller receives all the image file information when the image is downloaded from the camera, the time stamp information can be embedded into the bitmap data sent to the printer engine. By employing the present invention, the images when printed, will look similar to those developed by photo-processing centers wherein the date information is located on or adjacent to the image. In contrast to images printed by photo-processing centers, user communications with the printer's front panel are used to select where the date information is located on the image, or if the date information is printed at all.

Accordingly, a method is provided for interpreting time stamp information from a digital camera. The method comprises: opening a first format interpreter; receiving image information from a digital camera in a first format selected from the group including joint photographic experts group (JPEG) and tagged image file format (TIFF) formats, with a corresponding time stamp information; displaying the images with corresponding time stamps for editing; selecting the "print time stamp" option; selecting a time stamp layout for a corresponding image; converting the image information and time stamp information to bitmap information; and, supplying the edited images with corresponding time stamps for printing.

Some aspect of the method further comprise: selecting miscellaneous superposition overlays for corresponding images. Then, supplying the images with corresponding time stamps for printing

including supplying images with the selected superposition overlays such as text messages, backgrounds, clipart, and image borders.

Additional details of the above-described method, and a system for interpreting time stamp information from a digital camera are
5 provided below.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic block diagram illustrating the present invention system for interpreting time stamp information from a digital
10 camera.

Fig. 2 is a schematic block diagram featuring a different aspect of the present invention system of Fig. 1.

Fig. 3 is a flowchart illustrating the present invention method for interpreting time stamp information from a digital camera.
15

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 is a schematic block diagram illustrating the present invention system for interpreting time stamp information from a digital
20 camera. The system 100 comprises a controller 102 having a port on line 104 to receive image information from a digital camera 106 in a first format. Conventionally, the connection represented by line 104 is universal serial bus (USB), however, the present invention is not limited to any particular interface protocol. The controller 102 receives image
25 information from the digital camera 106 in a first format that includes the JPEG or TIFF formats. However, the present invention system is not

limited to any particular type of image format. The image information is supplied with a corresponding time stamp. The controller 102 has a port on line 108 to supply images with corresponding time stamps, converted into bitmap information.

5 A user interface 110 has a port on line 112 connected for communication with the controller 102. A printer engine 114 has a port connected to the controller 102 on line 108 for accepting the images with corresponding time stamps for printing. A specialized photography printer 116 is shown encompassing the user interface 110 and printer
10 engine 114 functions. In some aspects, the printer can be a conventional dot-matrix or laser printer associated with a PC. As is understood in the art, lines 112 and 108 may be a common bus in some aspects of the system 100.

Fig. 2 is a schematic block diagram featuring a different
15 aspect of the present invention system 100 of Fig. 1. As shown, the digital camera 106 is connected to a personal computer (PC) 200 on line 202. The PC 200 is connected to the printer 116 via line 204. In some aspects of the system 100, line 204 can be a parallel port cable or USB connection. Alternately, line 204 can represent a network connection, such as a local
20 area network (LAN) connection, to name but one example. The user interface 110 can be a printer front panel, as in Fig. 1, or a display and keyboard user interface 206 (or equivalent) connected to the PC 200 on line 208.

Referring now to both Figs. 1 and 2, regardless of which
25 system aspect is used, the user interface 110/206 accepts time stamp print user prompts and supplies instructions to the controller 102 for printing a

time stamp. The controller 102 supplies time stamp information, with its corresponding image, as bitmap information on line 108 in response to time stamp print commands from the user interface.

In some aspects of the system 100, the user interface 110/206 receives images for display. The user interface 110/206 also receives image modification user prompts. For example, the user may be able to magnify a portion of the image in response. Conventionally, there are many image modifications that can be made to digital photographs before they are hardcopy printed. The user interface 110/206 supplies commands to the controller 102 for modifying the images with corresponding time stamps, and the controller 102 modifies the bitmap image data in response to commands from the user interface.

The user interface 110/206 accepts user prompts for selecting a time stamp layout on a corresponding image, and supplies the time stamp layout commands to the controller 102. The controller 102 accepts the time stamp layout information and provides images with corresponding time stamp layouts for printing in response to the time stamp layout commands. More specifically, the time stamp layouts include features such as the location of the time stamp on the image, the time stamp font style, the time stamp font size, and the time format. The time format refers to expression of a date as "January 1, 2002", or "01/01/2002". The time format also controls the ordering of the day, month, and year. In some aspects of the invention, the time stamp information includes the time (the hour and minute of the day). As above, the user has the option of representing the time in many formats. For example, the time can be represented as AM/PM or military time.

In some aspects of the system 100, the user interface 110/206 also accepts prompts for selecting miscellaneous superposition overlays for corresponding images. The controller 102 supplies images for printing with the corresponding superposition overlays in response to the
5 miscellaneous superposition overlay prompts. More specifically, superposition overlays such as text messages, backgrounds, clipart, and image borders can be created and sent to the printer engine 114 as bitmap data.

Functional Description

10 The present invention system permits a user to modify or add information to a printed image through a user interface, such as a printer front panel. Once the printer controller receives the data, it invokes the proper interpreter such as JPEG or TIFF to parse the data and embeds the user desired information (date, description etc) to the
15 image data.

In one aspect (Fig. 1), the printer consists of an engine, controller, user interface, and a USB port. The USB port allows the user to directly connect a digital camera's flash card to the printer. Once the card is inserted into the smart media, the printer controller starts reading
20 and parsing the data. Once this process is completed, the images are shown on the printer's front panel or on the printer's embedded web page if the printer has one. At this point, the user can select the image they want to print. By monitoring the current setting of the front panel, the controller makes decisions on whether to embed the date (time stamp)
25 information in the bitmap information being sent to the print engine. If users choose to include the date information, certain fonts can also be

selected for the conversion of JPEG or TIFF data information into the raster or bitmap data. According to the orientation of the image, the time stamp raster data is then embedded into the proper part (i.e., lower left part for portrait orientation and lower right part for landscape orientation) of the image data. Then, the whole image data (image plus time stamp) is converted to bitmap data rendered to the printer engine for printing.

The user interface also gives users the ability to add a "picture frame" and descriptive text to the image. For example, if the images taken from the digital camera are from a child's birthday party, the user may want to type "Sam's 7th Birthday Party". This descriptive text is then included on the printed image. The descriptive text "Sam's 7th Birthday Party" will be printed on all of the images sent to the printer until the user changes it. From the front panel, the user may embed other description information including names and clipart that is printed on the image.

Fig. 3 is a flowchart illustrating the present invention method for interpreting time stamp information from a digital camera. Although the method is depicted as a sequence of numbered steps for clarity, no order should be inferred from the numbering unless explicitly stated. It should be understood that some of these steps may be skipped, performed in parallel, or performed without the requirement of maintaining a strict order of sequence. The method starts at Step 300. Step 302 receives image information from a digital camera in a first format with corresponding time stamp information. In some aspects, receiving image information from a digital camera in a first format in Step

302 includes receiving information in a first format such as JPEG or TIFF formats. Step 304 displays the images with corresponding time stamps for editing. Step 306 converts the image information and time stamp information to bitmap information. Step 308 supplies the images with
5 corresponding time stamps for printing. If edited, the edited images with corresponding time stamps are supplied for printing.

In some aspects, Step 301 opens a first format interpreter. Then, receiving image information from a digital camera in a first format in Step 302 includes using the first format interpreter to accept the image
10 information and corresponding time stamp. Converting the image information and time stamp to bitmap information in Step 306 includes using the first format interpreter to convert the image information and corresponding time stamp into bitmap information.

In some aspects of the method, Step 305a selects the "print
15 time stamp" option. Then, converting the image information and time stamp to bitmap information in Step 306 includes converting the time stamp into bitmap information in response to selecting the "print time stamp" option. Note, in this aspect of the method the time stamp information is not printed unless the "time stamp option" is selected.
20 Alternately, the method can automatically print the time stamp information.

In other aspects, Step 305b selects a time stamp layout for a corresponding image. Selecting the time stamp layout for the corresponding image includes selecting features such as the location of the
25 time stamp on the image, the time stamp font style, the time stamp font size, and the time format. If the time stamp includes hour and minute

information, this information can also be selectively included as part of the time stamp. Then, supplying the images with corresponding time stamps for printing in Step 308 including supplying the image with the selected time stamp layout.

5 In some aspects of the method, Step 305c selects miscellaneous superposition overlays for corresponding images. Selecting miscellaneous superposition overlays for corresponding images includes selecting an overlay such as a text messages, backgrounds, image borders, and clipart. Then, supplying the images with corresponding time stamps
10 for printing in Step 308 including supplying images with the selected superposition overlays.

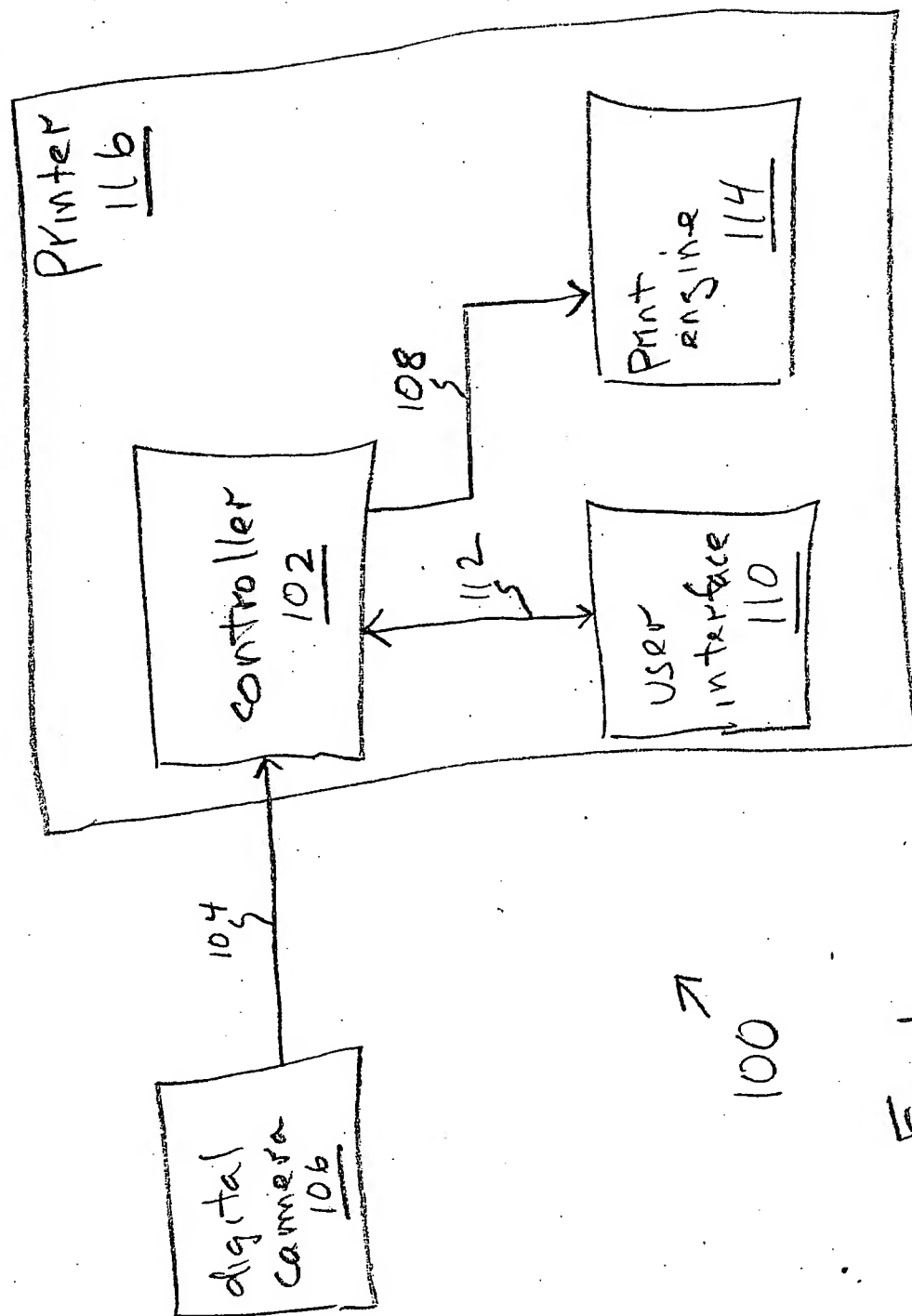
A system and method have been presented for interpreting time stamp information downloaded from a digital camera, so that it can be included in the printed image. Specific examples have been given as to
15 how the invention may be enabled, but the invention is not necessarily limited to just these examples. Likewise, examples have been given for the kind of modifications that can be performed on a printed image. Again, the invention is not limited to just these examples. Other variations and embodiments of the invention will occur to those skilled in
20 the art.

WE CLAIM:

SYSTEM AND METHOD FOR PRINTING A DIGITAL CAMERA IMAGE WITH TIME STAMP

ABSTRACT OF THE INVENTION

5 A system and method are provided for interpreting time stamp information from a digital camera. The method comprises: opening a first format interpreter; receiving image information from a digital camera in a first format selected from the group including joint photographic experts group (JPEG) and tagged image file format (TIFF)
10 formats, with a corresponding time stamp information; displaying the images with corresponding time stamps for editing; selecting the "print time stamp" option; selecting a time stamp layout for a corresponding image; converting the image information and time stamp information to bitmap information; and, supplying the edited images with corresponding
15 time stamps for printing. Some aspects of the method further comprise: selecting miscellaneous superposition overlays for corresponding images. Then, supplying the images with corresponding time stamps for printing including supplying images with the selected superposition overlays such as text messages, backgrounds, clipart, and image borders.



100

Fig. 1

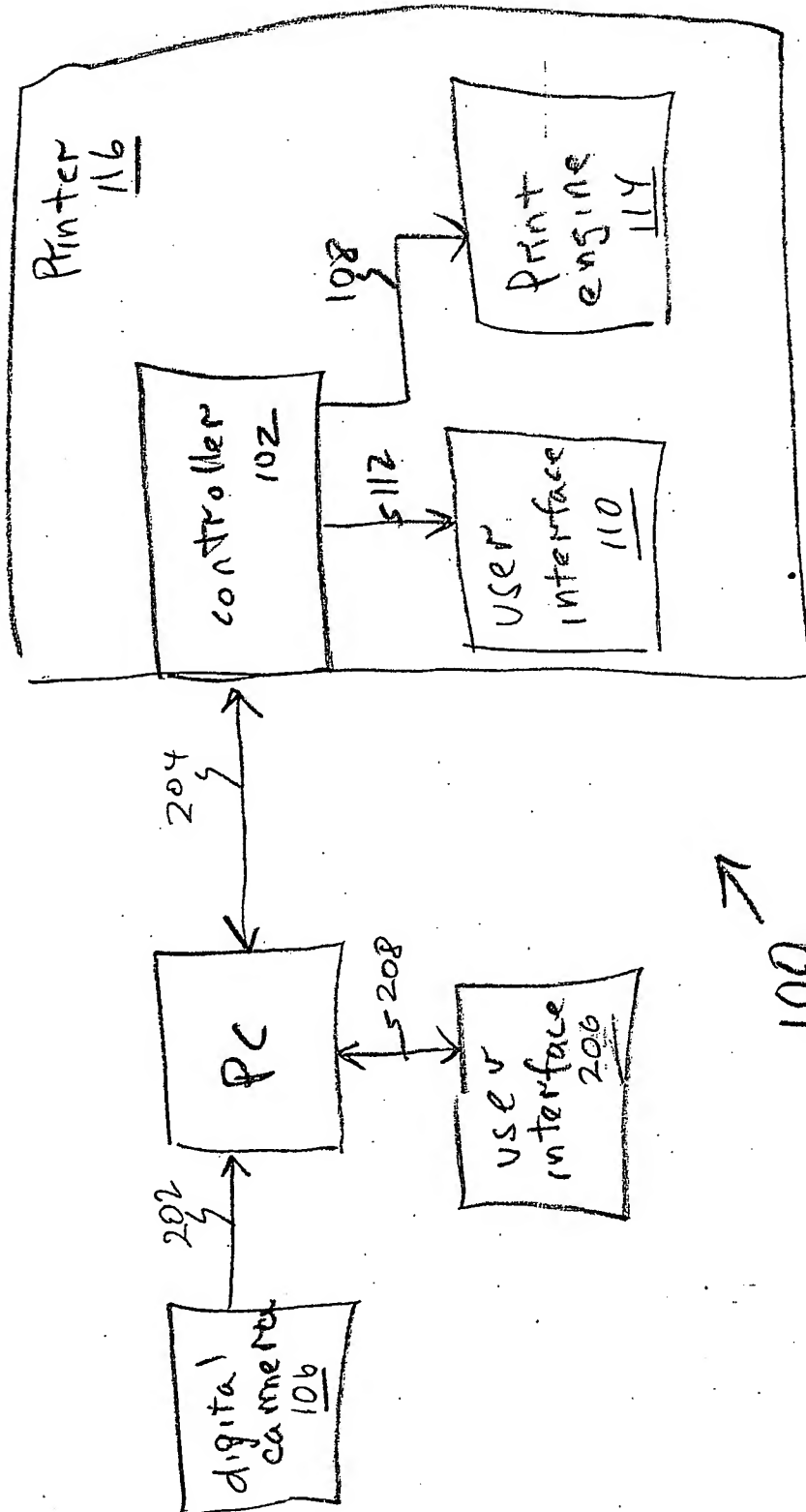


Fig. 2

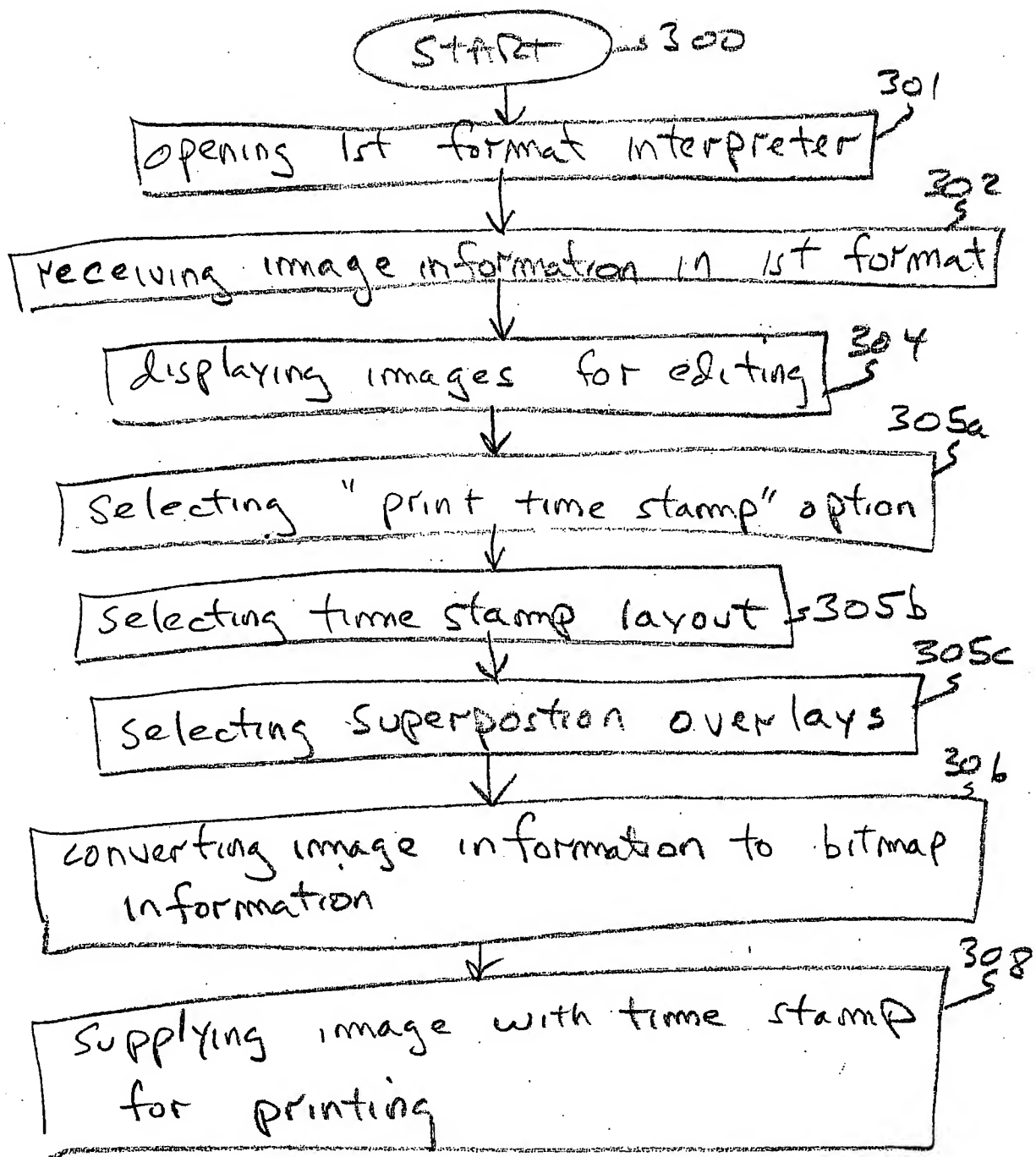


Fig. 3